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Science and Man . . . .

By Joshua Lederberg

The Legal Start of Life

BIOLOGY CONFRONTS law in an important arena of social policy in the question, "When does life begin?"

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The protection of human life is a central theme of the social order: murder is matched only by treason as the gravest crime a citizen can commit.

To bolster humane society, we treasure a moral conception of the dignity of human life, but then we face the problem of defining its boundaries. What is a human being? Where in space and when in time does he start and end?

Modern man knows too much to pretend that life is merely the beating of the heart or the tide of breathing. Nevertheless, he would like to ask biology to draw an absolute line that might relieve his confusion.

The plea is in vain. There is no single simple answer to "When does life begin?" despite the metaphors that help to teach reproductive biology in grade school.

IN CONTEMPORARY experience, life in fact never begins—it is a continuum from generation to generation. One can argue whether life ever "began," whether, in the evolution of increasing complexity, matter ever suddenly became alive.

If so, the event dates back three billion years to the dawn of organic evolution. From that time, life on earth has been a continuous process of information transfer. DNA molecules have generated DNA molecules in an unbroken line of descent, punctuated by the mutations and growing organization that culminated in man.

There is a similar continuity in development. The fertilized ovum has DNA with information content similar to that of other cells in the body. It follows a path of development that gradually differentiates a human being, but there is no single moment at which it suddenly acquires all the attributes of humanity. (Indeed, the worst tragedies are the articulate bipeds who may never become fully humanized.)

After fertilization, the egg may still follow several courses. In large proportion, it may fail to implant. Of the eggs that do implant, a fourth will develop too monstrously to survive more than a few weeks, the less grief the sooner the spontaneous abortion.

The fertilized egg has another interesting option. It might divide into two or more embryos—that is, one egg eventuates several lives.

IN ITS EARLY development, the human embryo is hardly distinguishable from that of any other animal. The DNA in its chromosomes does distinguish it, the same kind of DNA that is passed on, cell to cell, in the placenta that helps nurse the fetus but will be discarded when the fetus is delivered and becomes a child.

Rather late in development, the fetal brain takes part in a special acceleration of growth, but the most remarkable difference between man and his nearest cousins is the continued development of the human brain after birth. The human fetus has less apparatus with which to speculate about its prospects of earthly existence than does the adult monkey.

By the time of birth, however, the human infant has voiced a claim to life. It is an evolved part of our humanity that few adults would resist that claim once heard, however, irrational that sympathy may be.

Biologically, however, the crucial point of divergence between man and ape falls during the second year of life, when the infant begins to listen and talk intelligently. At that point, he first takes an active part in human society, differently than is possible for the chimpanzee. He is no longer a mere household pet but a responsive human being.

The biologist, then, is not really very helpful to the law. The question of when life begins is answered according to the purposes for which we ask it. Clearly, we must make arbitrary demarcations in the continum.

Each religion is entitled to its ritual judgments and will use these for its own arbitrary rule. For social order, clarity and consensus are paramount, and society must answer the question in these terms without the benefit of any absolute judgments from science.

In the context of present-day society, life is leigslated to begin no later than live birth, an event less ambiguous than most incidents of human life. This principle is actually recognized de facto, as Glanville Williams points out in the leading reference "The Sanctity of Life and the Criminal Law." No jurisdiction imposes penalties for induced abortion that begin to compare with those for infant murder.

The contemporary debate on the law of abortion has made many inappropriate references to biological definitions of the beginning of life. St. Augustine was wiser, confessing that "no human power could tell when this time was."

The subject is worthy of the most thoughtful debate, and both its style and its outcome will tell a great deal of the extent to which sectarian dogma or the social order predominate as the main themes of the law we enforce on the whole community.